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ABSTRACT

CNU Online is the computer-managed instructional delivery system of Christopher Newport University. Fully functioning to deliver wholly online courses since fall 1994, CNU Online has been using an officially approved assessment plan since January 1995. The plan is presented as a useful example for others developing online instructional delivery. The goal of the plan is to provide evidence of effectiveness in meeting the goals of CNU Online by using accepted standards of assessment that are consistent with state and regional guidelines. CNU Online must meet the defined state and regional standards for all on-campus programs with regard to assessment goals and quality. The levels of assessment include: (1) online program and institutional efficiency; (2) learning outcomes; (3) teaching effectiveness; and (4) student satisfaction with course delivery. Goals are defined for each of these areas, and methods for evaluation are outlined. These include standard surveys and more innovative approaches to evaluation. Some collateral assessment activities are suggested. Appendixes present an instructional evaluation survey, and a rating scale for peer group-based juried review of aspects of instructors' message logs. (SLD)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ASSESSMENT PLAN FOR CNU ONLINE

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ASSESSMENT PLAN FOR CNU ONLINE

PREFACE

CNU Online is the computer-managed instructional delivery system of Christopher Newport University. Fully functioning to deliver wholly online courses since fall, 1994, CNU Online has been utilizing the following officially-approved "Assessment Plan for CNU Online" since January 14, 1995. This assessment plan is hereby offered for broad dissemination as a helpful contribution to the burgeoning field of online instructional delivery.

ASSESSMENT PLAN FOR CNU ONLINE

Introduction and Rationale

The goal of this assessment plan is to provide evidence of effectiveness in meeting the goals of CNU Online by employing accepted and approved standards of assessment which are consistent with state (SCHEV) and regional (SACS) guidelines. Since the program being evaluated is new and highly innovative, it is expected that the assessment used will also require resourcefulness and innovation.

The plan was also designed to deliver results. What follows is the rationale for the innovative approach which was adopted, with the interests of both sound methodology and effective implementation of assessment results fully in view.

Assessment processes provide the linkages that connect diverse parts and strata of institutions and account for aggregate consequences of individual behavior. Institutional behavior is understood as the product of individual actions. From a policy perspective three stages of analysis focus on the operational level (e.g., what courses will be taught by whom, using what pedagogy, at what time and place); the collective choice (e.g., what rules will be made affecting retention, promotion, and tenure of personnel to administer instruction in what disciplines); and the constitutional level (e.g., the rules for rule making that govern operational and collective choices).

The decisions of a given level set the institutional rules for the next lower level. At the constitutional level the mission statement and the University Handbook (including rules for the performance appraisal system) set the basic boundaries for making collective choices about personnel qualifications and behaviors. The decisions made at the collective choice level determine the information and resources which govern decisions at the level of academic departments.

The constitutional rules identify the elements of what constitutes student satisfaction, the measures of effective teaching, the designated learning outcomes deemed to be a public good, and aggregate indicators of program efficiency which serve as bases of comparison with outputs of peer institutions.

The application of these constitutional rules provides the framework in which specified information and data in dossiers submitted to peer groups, deans, provost, and president are used to make collective decisions about individual and institutional effectiveness in achieving designated learning outcomes. Feedback from these collective processes is given to academic departments, committees, and academic support units to guide policy making and operational decisions at the level of consumer services. The

Undergraduate Academic Program Review Committee, to achieve systems integration, could focus more on the interface and service needs of relevant departments. The result of implementing these processes would be to use assessment data to promote interlevel linkages and to produce in the aggregate an integrated and coordinated service product to the consumer-publics.

Peer group and administrative review are little more than words on paper until they affect the behavior of course instructors and student target groups.

The particular usefulness of this model is that it delineates the components of a process made up of attributes of the individual actors and the "decision situation." Individuals can find themselves in institutional arrangements and in a relevant community of other persons who have a stake in the decisional outcome. Individuals make choices based on their valuations of events and issues in the decisional situation confronting the institution. The assessment process and its findings provide incentives and constraints and result in the effective use of resources. .

Both the timing of the assessment process and the character of its provisions will satisfy methodological rigor and scholarly integrity. In order to meet deadlines and operate within budget in the short run, there may need to be a phased implementation of the full assessment package described below. The implementation schedule ultimately must be consistent with the minimum reporting guidelines set forth in the original terms of the CNU Online budget initiative document.

Assessment plans and procedures described in this document are subject to review and revision in the light of subsequent experience. A review of the plan will be undertaken annually. The first revised document detailing assessment procedures will be circulated no later than December 15, 1995.

STATE AND REGIONAL GUIDELINES REGARDING ASSESSMENT

State and regional guidelines are relevant to assessment of student learning and performance and to the broader evaluation of programs. At the present time CNU Online is regarded as part of the on-campus academic program since its design and implementation are locally controlled. As such, the guidelines applying to the on-campus programs also apply to CNU Online.

Three principles are particularly germane to assessment as defined by state and regional guidelines. First, the institution must demonstrate how it will achieve its goals, particularly student learning goals, and maintain a high standard of quality in doing so. Accordingly, goals must be stated which are specific and assessable. Second, the assessment should provide assurance that

standards of quality are successfully maintained at an appropriate level regardless of the medium of the course (i.e., electronic or other) or the methods of instruction adopted. Third, the responsibility for the conduct of assessment should be appropriately delegated and shared.

Of the three principles, the first principle is well understood and requires no further comment. The third is covered by the designation of responsibility found in this document. Only the second requires further comment.

SCHEV's concern as regards the second principle is clear and understandable. It is a concern that students have a reasonable assurance that the course offerings they believe they are taking, based on published descriptions, are accurate regardless of where or under what format the course is offered. In particular, the objectives of the course in terms of student outcomes will have some similarities (not total but clearly some similarities), for courses having the same course name and description, whether the format is online or in the classroom. SCHEV's concern may have policy implications in the future concerning the encouragement and funding of programs to deliver educational services in the most cost-effective and efficient manner. Relevant data (primarily student-outcomes related but also student satisfaction measures) are needed to make such recommendations. Further, this type of information can be useful on the institutional level as well; i.e. evidence showing parity or disparity in performance and satisfaction may be used either to reinforce what we are doing or to modify teaching and learning to produce even more favorable results.

Implementation of the SCHEV guidelines should focus on course-specific comparisons. The guidelines make reference to full programs and to courses which are part of a degree program. While both of these situations exist, for the present at least it is not the comparisons of programs which should be of paramount concern pursuant to these guidelines, but the course-by-course comparisons.

Since assessment data resulting from the implementation of this plan will have both internal audiences and a primary external audience (i.e. SCHEV), it is important to distinguish the audiences for purposes of dissemination of findings. Not all assessment data which are useful internally need to be included in reports to SCHEV. The decision regarding what is relevant to report to SCHEV will be based on the reporting requirements associated with the original budget initiative document and SCHEV's legitimate concerns as outlined above.

BACKGROUND DATA

Preliminary assessment should include developing a statistical description of students who choose to enroll in on-line courses (i.e. age, gender, ethnic, prior enrollment, GPA, classification, other background). This type of information is essential to any attempt to account for background characteristics as a factor in student learning which is independent of program or course effects. Since the student characteristics associated with enrollment in on-line courses may be different from other students' characteristic profiles, these differences could help to account for apparent program and course-related effects or their apparent lack of effect.

LEVELS OF ASSESSMENT IN INSTITUTIONAL CONTEXT

This plan views the CNU Online program as integrally related to the CNU institutional context. There are distinct advantages in integrating assessment practices wherever possible into ongoing institutionalized procedures. One benefit is that assessment can then be carried out less intrusively and with generally greater acceptance and effectiveness. Another advantage is that the assessment data are generally more likely to inform and have the influence on the institution that they warrant when they are integral to its established procedures rather than external to them. Thus, evaluation in this plan takes place within the institutional context deriving information from four distinct levels and in turn potentially informing the institution in a number of ways. These levels include (from broadest to narrowest):

- Level 1: Online program/institutional efficiency
- Level 2: Learning Outcomes
- Level 3: Teaching effectiveness
- Level 4: Student satisfaction with course delivery.

For our purposes there are four levels of goals corresponding to the levels of evaluation. The following presentation includes the relevant goals followed by the assessment methods designed to measure their fulfillment. It should be stated at the outset that the anticipated use of information, by levels, will be as follows: levels 1 and 2 will be for uses both external and internal to the institution, and levels 3 and 4 will be reserved for internal use only.

I. ONLINE PROGRAM/INSTITUTIONAL EFFICIENCY

Relevant Goal Statements and Their Measurement

The following goal statements apply to the entire CNU Online program. The main focus of the goals is upon the efficiency of service delivery. The methods of measurement of these elements are preliminarily defined, or an appropriate schedule for such development, appear under each relevant statement. The Office of Institutional Effectiveness will take the lead in this area. Appropriate parameters, variable definitions, and methods of measurement will be defined by April 15, 1995.

1. Degree productivity will be enhanced and student retention will be increased.

   Degree productivity will be measured in terms of the number of graduates and the length of time to attain a degree. Student retention will also be examined over time both for students with the online degree intention and other students enrolled in online courses. However, the definition of variables, cohorts, and methods will be the subject of further delineation during spring, 1995.

2. Accessibility for students with financial and mobility problems will be enhanced.

   Program accessibility will be measured in terms of convenience and necessity as identified by students. A complete catalog of constraints and limitations on access, and preliminary data on the prevalence of each, will be created during spring, 1995. Further definition of variables, cohorts, and methods will be accomplished as needed during the same time period.

3. Cost effectiveness and operational efficiency will be enhanced.

   The efficiency of the online program will be compared to the classroom program using a number of measures of cost. Included among the costs to be considered are: building and facilities, admissions, registration, financial aid, billing and payment services, veterans services, bookstore, career and counselling services, other student services, information management costs (IES, computer labs, information/technology services), FTE student/teacher ratio, and telecommunications costs. Cost effectiveness also will be measured by student opinion in terms of the importance of scheduling, travel, etc.

   However, the above is only a prelimary listing. Further definition of variables and methods will be accomplished as needed during spring, 1995.

4. Student learning and academic advising will be enhanced by analysis of archival information from the digital environment.

   This area represents a serious objective for scholarly research which is likely to pay great dividends for practical application. The existence of extensive message logs of the CNU Online course experience provides a marvelous opportunity. However, this interest is long-term and will receive lower priority during the initial phases of program implementation.

II. LEARNING OUTCOMES

Relevant Goal Statements and Their Measurement

Assessments at the second level attempt to provide direct evidence of the fulfillment of the following relevant student outcome goals. Operational measurement, and thus assessment, of goals 1-6 is also defined below and is further elaborated in the paper, "Teaching Online, Computer Managed Conferencing," by Williams, Teschner and Miller.

Statements 1-6 below should be read beginning with the phrase "Students enrolled in CNU Online courses will..."

1. Learn to read, interpret, and critique written texts without oral interpretation (vs. passive lecture and memorization).

   Operational measurement will be performed in terms of two areas:

   a. instructor assessment of student growth in guided reading using unit learning objectives
   b. pre- and post-tests for each course module

2. Learn to write clearly, analytically, and persuasively within a conceptual framework.

   This goal will be assessed in terms of templates which provide criteria for quality control of the work product. Examples of such templates are:

   a. purpose and scope of the essay
   b. paragraph organization as indicated by the scope statement
   c. summary of contents
   d. concluding assessment of topic significance
   e. pro-contra-reply
   f. comparative analysis
   g. cause and effect analysis
   h. alternative analysis
   i. concept application
   j. personal analogy

k. structure-function analysis
l. criteria identification and evaluation analysis
m. case analysis

In addition to the above, other appropriate templates may be developed to translate form into substance and provide criteria for evaluation of student work products. Online instructors are encouraged to use their disciplines to do so.

3. Learn to work with peers creating problem-solving documents and form cohesive groups (teams and task forces).

This goal will be measured in terms of:

a. appropriate complexity of division of labor among group members
b. creativity of techniques for conflict resolution and application of negotiation skills
c. quality of analysis and content of work product as measured by:
   (1) message continuity, i.e., responding to other messages in context
   (2) concept elucidation and concept structure apprehension
   (3) divergent and convergent thinking processes
   (4) civility of message tone and toleration of diversity of opinion

4. Learn to use technology.

This goal will be measured in terms of:

a. variety of software applications used
b. the variety and frequency of methodological applications which result in knowledge production and analysis
c. variety of data retrieval sources

5. Learn to be an independent learner to acquire knowledge and solve problems.

a. standardized tests of cumulative knowledge production and analysis
b. comprehensive tests prepared by major departments

In addition, student learning outcome goal number 6 states, in a generic way, the expected learning that will occur in the specific discipline or subject matter content of the course as described in the course syllabi. A pragmatic method of measurement related to this goal is defined below.

6. Students enrolled in CNU Online courses will demonstrate, on average, development of knowledge and skills (as called for on

the course syllabi, specifically for the course regardless of the medium) comparable to that of students in the equivalent classroom courses.

Measuring Learning Outcomes:

Essentially, the online program will require that the instructor build in assessment instruments of several types having differing objectives, as follows:

1. to identify an appropriate learning format that supports a high level of student learning

2. to identify what students already know at the start of a learning module

3. to identify what students have learned at the end of a learning module

4. to identify what can be certified as course learning at the end of a course

These assessments will become part of the teaching process and will be integrated into the content of the course. Although how students learn and what they know or have learned can all affect course performance, except for item 4 these items will not directly impinge on the grading of individual students.

As regards instruments and inquiry corresponding to item 1, currently studies are being planned having to do with the interaction of learning styles and a variety of learning outcome measures. An initial study is planned for spring, 1995. This research will help to inform the CNU Online instruction in tailoring instruction to student characteristics and learning needs, as implied in item 1. In addition, the background data described earlier is closely related to this item since, as stated earlier, the information gained would be "essential to any attempt to account for background characteristics as a factor in student learning."

Comparison of online courses and classroom courses can be difficult because of differences in teaching methodology. The differences are not total and they can be compared in areas where they are similar. Thus, pragmatic means to be described below will permit the application of items 2 and 3 above to this problem.

The proposed method involves having instructors of online courses choose a classroom section of a classroom course to assess and compare the two types of courses where they overlap.

The Online instructor and a classroom instructor teaching the same course will need to work together to implement this method, under the supervision of the department chairman. (If the

instructor is teaching the course both ways, this requirement will be obviated.) The course content will be reduced to a set of concepts, terms, key words and phrases that the two instructors agree represent essential knowledge of the course content. A pre-test on these concepts at the beginning of the course or module and a post-test at the end of the course or module will be administered. Questions will be randomly selected from the list of concepts in order to avoid selection bias. This approach will provide a pragmatic method of comparing courses taught in the two media on the basis of pre- and post-test comparisons in essential course content as defined above.

A successful trial of the above approach will lead to its being implemented as a requirement for all online courses.

In addition to course content learning, skill modules (e.g., technical writing) also can be assessed through this procedure.

III. TEACHING EFFECTIVENESS LEVEL

Peer Group Review of Effective Instruction

Another level for assessment will involve the peer group procedures, another well-established institutional practice, in the review of effective online instruction. Although traditionally these procedures have much to do with personnel decisions and little or nothing to do with assessment, this plan proposes to involve the peer group members in making assessment-related ratings. These ratings will be used for program evaluation purposes (by means of the instrument to be described below); in addition the information supplied, and the associated ratings, can be considered by the peer groups in making their joint recommendations. The institutionalized procedure continues to provide checks on these recommendations, including the deans' and Provost's reviews.

The peer group for each faculty person being evaluated will have available a copy of the message log for the courses taught by the candidate. (The log copy will not include restricted or student grade messages.) Specific citations in the message log will be used to support the conclusions drawn by the peer group. The instructor must document for the peer group specific examples in the course log supporting effectiveness in relation to the following items. This process itself can provide additional incentive to the instructor to derive the maximum educational benefits for students from this medium.

The ratings will document the extent to which specific processes, designed to facilitate the achievement of course objectives, were in fact carried out by the instructor. Thus, this level of assessment deals directly with the processes or instrumentalities of achieving the course and program objectives.

A detailed rationale is included in the paper "Teaching Online, Computer Managed Conferencing," by Williams, Teschner and Miller. A copy of the rating scale questions appears below.

Questions and Guidelines for Peer Group Review

The peer group for each faculty person being evaluated will address at least the following factors. The peer group will have available a copy of the message log for the courses taught by the candidate. (The log copy will not include restricted or student grade messages.) Specific citations in the message log will be used to support the conclusions drawn by the peer group. The instructor must document for the peer group specific examples, in the course log, supporting numbers 1-5 below. Numbers 6-8 will be provided by CNU Online. (CNU Online will write software to generate data for numbers 6-8.)

1. Did the instructor list the learning outcomes expected of each student at the completion of each reading assignment and at the end of the course?

2. Did the instructor guide the student in a process of inquiry that required the student to manifest skills of comprehension, analysis, synthesis, application, and evaluation of the subject matter?

3. Did the instructor assign the student to small groups of persons who collectively were required to create a group to negotiate differences in the production of a work product?

4. Did the instructor integrate skill modules into the content of the course subject matter, as means of teaching skills (for example, technical writing, statistics, etc.) across the curriculum?

5. Did the instructor require students to retrieve, analyze and interpret data using computer-managed resources?

6. Did the instructor manage the learning environment in such a way that the substantial majority of messages in the log were peer-to-peer?

7. Did students regularly upload from five to ten messages on average each week?

8. Did the instructor logon the course conference to interact with students on the average of twice per day?

9. Did the instructor's leadership result in at least fifty percent of the student messages meeting the following criteria:

- connectivity with the subject matter of other messages
- dialogical quality of the message subject matter
- conciseness of message word usage
- elucidation of concepts and comprehension of conceptual frameworks
- provocative and dialectical quality of message subject matter
- divergent and convergent character of message content
- civility of message tone and toleration of diversity of opinion

In order to elicit appropriate quantitative data for each of the relevant questions, a rating scale form has been development (see Appendix B).

IV. STUDENT SATISFACTION

Relevant Goal Statement

Students enrolled in CNU Online courses will demonstrate, on average, satisfaction and motivation to persist and make progress in CNU Online courses comparable to that of students in the equivalent classroom courses.

Assessment Method

The first level is student satisfaction. The standard method for assessing student satisfaction in relation to CNU courses is the Instruction Evaluation Survey or IES. The procedures associated with this instrument are already well-integrated with institutional practice. The necessary steps and safeguards have now been taken resulting in implementation of an online version of this instrument during fall 1994. This mechanism is in place and can and should be used to maximum benefit for assessment purposes.

The assessment methods using this mechanism are two:

1. First, the average responses of students to relevant questions on the Instruction Evaluation Survey should be compared between online and classroom versions of the same course. Online and in class versions of that instrument are equivalent as far as the relevant questions are concerned. The departments concerned routinely will have access to the relevant results to review.

2. Second, additional questions will be added to the online IES to gather student satisfaction data bearing on students' perception of their educational gains in the course and other concerns directly related to the goals of CNU Online. The list of additional questions are

found in Appendix A along with questions 1-22 of the original online IES.

Aggregated results for each course will be prepared routinely in computer-generated report form each semester. Instructor identifications will be removed from these reports. These results will be made available to the Director of Assessment and Evaluation for reporting purposes and to the Provost, deans and relevant departments for program review purposes.

Related to student satisfaction is student motivation to persist, or student retention, which is dealt with under the section dealing with Online Program/Institutional Efficiency.

COLLATERAL METHODS

The following activities will be carried out as time and resources permit in parallel with the other assessment methods described above and will be under the supervision of the Director of Assessment and Evaluation.

1. Comparison of similar courses on-line and in the classroom, across the program, will be carried out using an innovative assessment technique. This technique examines overall grade performance of students in courses for which the prerequisites might have been taken either on-line or in a classroom. An equivalence of courses would be indicated by a similar distribution of grades regardless of the format of the prerequisite course. (This technique has been applied successfully to the study of transfer prerequisites versus CNU prerequisites.)

2. Another overall activity which may be referred to as assessment (in a broad sense) may be adopted depending on availability of staff and financial resources. This approach would involve having the same individual--under the supervision of the Director of Assessment and Evaluation--auditing the same class offered both ways. Detailed journals would be kept, with particular emphasis on the same or similar assignments. The instructor's (or instructors') cooperation would be sought.

Uses of information from this source would be limited. The process would have no part in the external reporting to SCHEV. The Director of Assessment and Evaluation, in consultation as needed with CNU Online staff would note any unusual circumstances and make sure that atypical conditions would be properly understood as such.

3. A final potentially useful collateral activity will be referring occasional matters to an external consultant or consultants. The advice and recommendations received, while in no sense binding, may be well worth considering. The activity can also provide additional credibility in the form of external validity and scholarly integrity which need to characterize our efforts as we prepare to respond to external inquiries.

APPENDIX A: ONLINE INSTRUCTIONAL EVALUATION SURVEY (IES) WITH ORIGINAL QUESTIONS (1-22) AND ADDITIONAL QUESTIONS (23-39)

Items number 1 through 14 use the following response choices: "Strongly Agree, Mildly Agree, Neutral, Mildly Disagree, and Strongly Disagree."

1. The course was consistent with the course description in the catalog.

2. The instructor's messages showed evidence of careful thought and preparation.

3. The instructor's grading policies for this course were clearly explained early in the term.

4. The instructor's grading procedures were fair.

5. Graded assignments and course contributions were responded to in a timely fashion.

6. Grading covered knowledge, application, or reasoning that could be expected on the basis of course content.

7. The instructor encouraged students to seek help when needed and was readily accessible when he or she did so.

8. The instructor demonstrated command of the subject matter of the course.

9. The instructor's messages to me and to the class made the course material clear and understandable.

10. The instructor demonstrated interest and enthusiasm for the subject matter.

11. I found the instructor to be intellectually motivating and stimulating.

12. The instructor consistently devoted the time necessary to make this course a valuable learning experience for me.

13. I found this professor to be an effective teacher in this course.

14. The subject matter of this course is interesting.

15. The subject matter of the course is a valuable part of my education.

16. What is your present class standing?

    Response choices: freshman, sophomore, junior, senior

17. Please mark one.

    Response choices: male, female

18. Please mark one.

    Response choices: asian, black, native american, white, hispanic, other.

19. What is your age?

    Response choices: 18 or less, 19-22, 23-30, over 30.

20. What grade do you expect to receive in the course?

    Response choices: A, B, C, D, F

21. If you had the choice of taking the course online or in a classroom, which would it be?

    Response choices: online, in classroom

22. What kind of requirement is this course?

    Response choices: distribution, major field, elective

Additional questions to measure student opinion related to assessment. All questions will be answered on a scale of 1 to 5 (the same scale used for items 1-15).

23. The course developed my problem solving skills.

24. The course enabled me to draw reasonable inferences from observations.

25. The course developed my ability to integrate and synthesize information.

26. The course developed my ability to use facts to support opinion.

27. The course developed my ability to appreciate the historical development of the subject matter addressed in the course.

28. The course developed my tolerance for other viewpoints.

29. The course developed my ability to work productively with others.

30. The course developed my ability to resolve controversies.

31. The course helped me learn the vocabulary and concepts of the subject.

32. The course helped me learn the objectives and values of the subject.

33. The course developed my reading skills.

34. The course developed my technical writing skills.

35. The course developed my telecommunications skills.

36. The course developed my computer software skills.

37. It is more convenient for me to take this course online instead of in a classroom.

38. Online courses are necessary for me to complete an undergraduate degree.

39. Cost is a factor (scheduling, travel, etc.) in taking online courses.

APPENDIX B: RATING SCALE FOR USE IN PEER GROUP-BASED JURIED REVIEW OF RELEVANT ASPECTS OF INSTRUCTORS' MESSAGE LOGS

Instructions: For items 1-5, use the following 5-point scale in rating the evaluee's online message log with respect to the following dimensions:

1 = little or no evidence
2 = some evidence
3 = good amount of evidence but not always consistent
4 = strong evidence and consistency
5 = exemplary evidence with respect to this characteristic

1. The instructor listed the learning outcomes expected of each student at the completion of each reading assignment and at the end of the course.

2. The instructor guided the student in a process of inquiry that required the student to manifest skills of comprehension, analysis, synthesis, application, and evaluation of the subject matter.

3. The instructor assigned the student to small groups of persons who collectively were required to create a group to negotiate differences in the production of a work product.

4. The instructor integrated skill modules into the content of the course subject matter as a means of teaching skills (for example, technical writing, statistics, etc.) across the curriculum.

5. The instructor required students to retrieve, analyze and interpret data using computer-managed resources.

For items 6-12, rate the evaluee on the approximate percent of student messages meeting the following criteria. Use the following scale:

1 = 20 percent or less meet the criterion
2 = 21 to 40 percent meet the criterion
3 = 41 to 60 percent meet the criterion
4 = 61 to 80 percent meet the criterion
5 = 81 percent or more meet the criterion

Items 6-12 are complete sentences beginning: "Student messages revealed":

6. connectivity with the subject matter of other messages.

7. dialogical quality of the message subject matter.

8. conciseness of message word usage.

9. elucidation of concepts and comprehension of conceptual frameworks.

10. provocative and dialectical quality of message subject matter.

11. divergent and convergent character of message content.

12. civility of message tone and toleration of diversity of opinion.